

CLAIMS

5        1. A method for transmitting data over a transmission channel, comprising:  
accepting, at an input of a data transmitter, data that has been encoded into a  
base layer and an enhancement layer;  
transmitting the base layer on the transmission channel;  
determining if there is enough bandwidth available to the data transmitter to  
10 transmit data in addition to the base layer already transmitted; and  
transmitting the enhancement layer if there is enough bandwidth available to  
transmit another layer.

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2. The method of claim 1 wherein determining if there is enough bandwidth  
available to the data transmitter to transmit data in addition to the base layer comprises  
calculating a bandwidth previously used by the data transmitter in previously transmitting  
layers.

3. The method according to claim 1 wherein determining if there is enough  
20 bandwidth available to the data transmitter to transmit data in addition to the base layer  
comprises measuring data traffic on the transmission channel to determine if enough  
bandwidth exists to transmit additional layers.

4. The method according to claim 1 wherein the data transmitter has a pre-set  
25 target data rate, and wherein determining if there is enough bandwidth available to the data  
transmitter to transmit data in addition to the base layer already transmitted comprises

5 determining whether an average bandwidth used by the data transmitter over a last measuring period is below the pre-set target data rate.

10 5. The method according to claim 4 wherein the last measuring period is a period of time.

15 6. The method according to claim 4 wherein the last measuring period is a period in which a predetermined number of pieces of data have been transmitted over the transmission channel by the data transmitter.

20 7. The method according to claim 1 wherein the data transmitter has a pre-set maximum transmission rate, and wherein the data transmitter ensures that its rate of transmitting data is below the pre-set maximum transmission rate.

25 8. The method according to claim 1 wherein the data is additionally encoded as a second enhancement layer, the method further comprising:

determining if there is enough bandwidth available to the data transmitter to transmit data in addition to the base and enhancement layers already transmitted by the data transmitter; and

transmitting the second enhancement layer if there is enough bandwidth available to transmit the second enhancement layer.

5        9.      The method according to claim 1 wherein transmitting the base layer on the  
transmission channel comprises transmitting the base layer on a LAN connection between  
two or more computers.

10       10.     The method according to claim 1 wherein transmitting the base layer on the  
transmission channel comprises transmitting data from a media server to an image projector.

11.      The method according to claim 1 wherein transmitting the base layer on the  
transmission channel comprises transmitting data from a media server to a decoding device.

12.      The method according to claim 1 wherein determining if there is enough  
bandwidth available to the data transmitter to transmit data in addition to the base layer  
already transmitted comprises calculating at least two average bandwidths used by the data  
transmitter, each of the average bandwidths calculated over different measuring periods.

20       13.     A multi-layer data transmission system, comprising:  
                a transmission scheduler having a first data input configured to accept an  
encoded base layer of data and an enhancement layer of data, and the transmission scheduler  
having an output terminal; and  
                a scheduling operation controlling the transmission scheduler and configured  
25      to cause the transmission scheduler to send the base layer of data from the output terminal of  
the transmission scheduler when it is received; and configured to determine if there is enough  
bandwidth to send the enhancement layer of data.

5        14. The data transmission system according to claim 13 wherein the scheduling operation is also configured to send the enhancement layer of data from the output terminal of the transmission scheduler if there is enough bandwidth to do so.

10      15. The data transmission system according to claim 14, wherein there is enough bandwidth to send the enhancement layer if an average data transmission rate of the transmission scheduler is less than a predetermined rate.

16. The data transmission system according to claim 14, wherein there is enough bandwidth to send the enhancement layer if there is available bandwidth on a transmission channel coupled to the output terminal of the transmission scheduler.

17. A data transmission system, comprising:

an encoder having an input for receiving a data stream and configured to encode the data stream into a base layer and at least one enhancement layer;  
a transmission scheduler coupled to the encoder and having an input terminal to accept the encoded layers of data, and having an output terminal coupled to a transmission channel;

a scheduling operation running on the transmission scheduler and configured to signal the transmission scheduler to send the base layer of data from the output terminal of the transmission scheduler after it is received, and configured to determine the bandwidth used by the transmission scheduler sending the base layer; and

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5           a decoder coupled to the transmission channel and configured to generate an  
image on a display based on the encoded layers of data received from the transmission  
scheduler.

18.       The data transmission system of claim 17 wherein the scheduling operation is  
10      configured to determine whether there is enough bandwidth available to the transmission  
scheduler to send a first of the at least one enhancement layers from the output terminal of the  
transmission scheduler.

19.       The data transmission system of claim 18 wherein the scheduling operation is  
15      configured to determine there is enough bandwidth available to the transmission scheduler  
when an average bandwidth rate used by the transmission scheduler is less than a target  
bandwidth rate.

20.       The data transmission system of claim 18 wherein the scheduling operation is  
25      configured to determine there is enough bandwidth available to the transmission scheduler  
when an instantaneous bandwidth rate on the transmission channel is below a predetermined  
rate.

21.       The data transmission system of claim 17 wherein the scheduling operation is  
25      configured to determine whether there is enough bandwidth available to the transmission  
scheduler to send a first and a second of the at least one enhancement layers from the output  
terminal of the transmission scheduler.

5        22. The data transmission system of claim 21 wherein the scheduling operation is  
configured to determine whether there is enough bandwidth available to the transmission  
scheduler to send the first of the at least one enhancement layers from the output terminal of  
the transmission scheduler prior to determining whether there is enough bandwidth available  
to the transmission scheduler to send the second of the at least one enhancement layers.

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